

REMARKS

Claims 1-10, 12-29, 32-33, and 50 were presented for examination in the present application and remain pending consideration upon entry of the instant amendment, which is respectfully requested. Claims 20, 22-24, 27, and 33 have been withdrawn, but remain pending for rejoinder upon allowance of a generic claim. Claims 1 and 50 are independent.

Claim objections

Claims 1 and 15 were objected to for various informalities.

Claims 1 and 15 have been amended to obviate the objections thereto. Accordingly, reconsideration and withdrawal of the objections to claims 1 and 15 are respectfully requested.

Rejections under §112

Claims 2-4, 16, 25-27, and 29 were rejected under 35 U.S.C. §112, second paragraph.

The Office Action asserts that claims 2-4 merely recite mathematical equations without reciting any positive step. Applicants respectfully traverse this rejection.

Claim 2 recites the step of "selecting the temperature T_{eff} according to the formula". Similarly, claim 3 recites the step of "selecting the useful heat per unit weight according to the formula", while claim 4 recites the step of "selecting the energy loss per unit weight according to the formula". Applicants submit that claims 2-4 each positively recite steps and, thus, meet the requirements under §112. Reconsideration and withdrawal of the §112 rejection to claims 2-4 are respectfully requested.

The Office Action asserts that claims 25-27 depend on withdrawn claim 24 and thus cannot be examined. Applicants also respectfully traverse this rejection.

Claim 25 was previously amended to depend from claim 1, while claims 26-27 depends from claim 25 and, thus, also depend indirectly from claim 1. Thus, Applicants submit that claims 25-27 properly modify pending claim 1 and therefore meet the requirements under §112. Reconsideration and withdrawal of the §112 rejection to claims 25-27 are respectfully requested.

The Office Action asserts that the recitation of "introducing a melt" of claim 16 is unclear. Claim 16 has been clarified to conform more precisely to the elements of claim 1. Accordingly, reconsideration and withdrawal of the §112 rejection to claim 16 are respectfully requested.

Accordingly, reconsideration and withdrawal of the §112 rejections to the claims are respectfully requested.

Rejection under §103

Independent claims 1 and 50, as well as dependent claims 2-6, 8, 18-19, 25, 29, and 32, were rejected under 35 U.S.C. §103(a) over newly cited U.S. Patent No. 4,133,969 to Zumbrunnen (Zumbrunnen). Dependent claims 6-7, 10-12, and 26 were rejected 35 U.S.C. §103(a) over Zumbrunnen in view of newly cited U.S. Patent No. 5,738,811 to Gagel et al. (Gagel). Dependent claims 13-14 and 16-17 were rejected 35 U.S.C. §103(a) over Zumbrunnen in view of newly cited International Publication No. WO 0216274 to Rodek et al. (Rodek) as represented by corresponding U.S. Patent No. 7,694,533. Dependent claims 8-9, 14-15, 21, and 28 were rejected 35 U.S.C. §103(a) over Zumbrunnen in view of newly cited International Publication No. WO 0114266 to Romer et al. (Romer) as represented by corresponding U.S. Patent No. 7,137,277.

Applicants respectfully traverse these rejections.

Claim 1 recites, in part, the step of "selecting a temperature T_{eff} at which an energy consumption per unit weight of the inorganic materials is at a minimum (emphasis added)". Similarly, independent claim 50 recites, in part, the step of "selecting a temperature T_{eff} at which an energy consumption per unit weight of the inorganic materials is at a minimum (emphasis added)".

Applicants submit that the Office Action fails to make a *prima facie* case of obviousness by failing to assert that Zumbrunnen discloses or suggests selection of a temperature based on "energy consumption per unit weight of the inorganic materials" as claimed.

Rather, Zumbrunnen discloses that the direct coupling of the melt 16 to the current source 14 of the electric furnace 10 of the present invention also allows for passing an electric current through a powder of electrically conductive material, providing that material has been packed sufficiently to establish an unbroken current path therethrough. Obviously, once a current flow is established, the powder will be liquidized and, thereafter, additional solid materials could be added to maintain the melt level at the desired distance or spacing from the forward conductor 15. See col. 12, lines 10-20.

Thus, Zumbrunnen at best discloses adding additional powdered material to maintain the melt level the desired distance from the conductor. However, there is simply no disclosure in Zumbrunnen regarding selecting a temperature based on the energy consumption per unit weight as required by claims 1 and 50.

Further, Zumbrunnen discloses an arrangement for closely controlling the outer temperature of the skull 11 and heat transfer therethrough, along with the ability to

closely control the melt current thereby controlling the melt temperature. Here, the electric furnace 10 provides a close balancing between melt heat input and skull temperature to minimize the energy required to operate the device providing, thereby, a most efficient energy utilization. See col. 9, line 66 through col. 10, line 20.

Again however there is simply no disclosure in Zumbrunnen regarding selecting a temperature based on the energy consumption per unit weight as claimed.

Rather, Zumbrunnen clearly refers to the overall energy consumption of the crucible, which is not what is recited by claims 1 and 50. It is not the aim of claims 1 or 50 to keep the overall energy consumption as low as possible. Rather, the claims require selection of a temperature based on "**energy consumption per unit weight of the inorganic materials** is at a minimum".

The Office Action failed to address the claimed energy consumption, which refers to the energy consumption per unit weight and, thus, failed to make a *prima facie* case of obviousness.

In fact, the overall energy consumption of the skull may not minimal if operated at the claimed temperature. Applicants submit that it is a surprising finding that the energy consumption per weight unit can be reduced to a minimum at operating conditions where the melt temperature and hence the overall energy consumption is very high. There is simply no disclosure or suggestion in Zumbrunnen for this finding.

The Office Action fails to assert that any of the remaining references, namely Gagel, Rodek, and Romer, cure the aforementioned and other deficiencies present in Zumbrunnen.

Therefore, claims 1 and 50, as well as claims 2-10, 12-19, 21, 28-29, and 32 that depend therefrom, are not disclosed or suggested by the cited art. Reconsideration and withdrawal of the rejections to claims 1-10, 12-19, 21, 28-29, 32, and 50 are respectfully requested.

Applicants respectfully request rejoinder of withdrawn claims 20, 22-24, 27, and 33, which depend from allowable claim 1 discussed above.

Summary

In view of the above, it is respectfully submitted that the present application is in condition for allowance. Such action is solicited.

In the alternative, Applicants submit that the instant amendment places the present application in better condition for appeal and does not require further consideration. Accordingly, entry and consideration of the instant amendment, at least for the purposes of appeal, are respectfully requested.

If for any reason the Examiner feels that consultation with Applicants' attorney would be helpful in the advancement of the prosecution, the Examiner is invited to call the telephone number below.

Respectfully submitted,

February 3, 2011

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